



BioSA Workshop

**Intellectual Property Rights and the
implications for SMMEs in the Biotech
sector**

List of Abbreviations and Acronyms

BioSA	Biotechnology Industry SMME organization in South Africa
DST	Department of Science and Technology
IP	Intellectual Property
IPR	Intellectual Property Rights
IRP Act	Intellectual Property Rights from Publicly Funded Research Act
LRD	Leuven Research and Development
NIMPO	National Intellectual Property Management Office
PCT	Patent Cooperation Treaty
R&D	Research and Development
SMMEs	Small, Micro and Medium Enterprises
TETRA	Technology Transfer
TTO	Technology Transfer Officers

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Introduction

The South African Government has introduced new legislation that provides an improved enabling environment for intellectual property (IP) development and management in South Africa. In August 2008 Mosibudi Mangena, the former Minister of Science, stated that much has been lost from South Africa in the field of IP rights, mostly due to lack of knowledge on how such rights work and how it should be managed and commercialised. He further indicated that this applies especially to intellectual copyright issues involving public funds. He pointed out that this legislation was aimed at facilitating the creation of IP based on IP rights and a system whereby the country could protect its inventors.

Poor flow of technologies and knowledge from research laboratories to industry has been identified as an area of particular concern and is regarded as an obstacle in producing more IP that would be beneficial to the public. Former Minister Mangena went on to say that the National Intellectual Property Management Office (NIPMO) to be housed within the Department of Science would manage IP where the state is involved as a contributing party to its development. This office will provide for the establishment of an Intellectual Property Fund to help finance patenting costs that is of national interest. The formation of such a fund is an attempt to increase the commercial success rate of technologies developed in the research laboratories.

Overview

Intellectual Property Rights

Intellectual Property (IP) rights cover any creation of the mind that is capable of being protected, either by South African or foreign law, from use by any other person for the benefit of society.

The Intellectual Property Rights Act

The Intellectual Property Rights from Publicly Funded Research Act (IPR Act) is designed to ensure that all government-funded research gets intellectual property protection if required.

According to section 15(4) of the IPR Act, a funding body can wholly own the IP generated, provided the funding body pays for the research and development conducted by the institution on a full cost basis. Section 15(2) stipulates that a funding body may become a co-owner of IP from publicly financed Research and Development (R&D), provided a contribution in resources has been made or IP has been created jointly. In such a case, arrangements for benefit sharing between creators and the institution should be made to conclude the agreement for commercialisation of the IP.

The BioSA Workshop

The BioSA workshop, hosted in Centurion on the 6th and 7th of May 2009, focussed on the interaction between Universities and Small, Micro & Medium Enterprises (SMMEs) in the biotech sectors relating particularly to the IPR Act and the implications of the Act. The intention of the workshop was to:

- Define expectations of both South African universities and SMMEs concerning cooperation at the levels of R&D and commercialisation of IP;
- Examine the feasibility of cooperation between an SMME and Universities;
- Establish an understanding of South African and Finnish university procedures and approaches towards external cooperation;
- Produce a series of recommendations to facilitate cooperation between SMMEs and Universities.

The objectives of the workshop were addressed by inviting actively involved speakers from different relevant sectors. Among these speakers were Prof Anastassios Pouris from the University of Pretoria, Mr Kari Paukkeri CEO of Licentia Limited in Finland, IP officer Dr Nele Berthels from Belgium and senior patent attorney Mr Mclean Sibanda from the Department of Science and Technology (DST) of South Africa. The workshop also included a case study of a biotechnology spin-out from a University setting. The audience assembled included funding bodies, delegates from SMME, University professors and research students from the University of Pretoria.

Presentations

Industry-University Interaction in South Africa

Prof Anastassios Pouris, Institute for Technological Innovation, University of Pretoria

Best-Practice policies

Prof Pouris discussed best-practice policies observed in other countries. He pointed out that those countries that have taken on a systems perspective and have implemented a broad set of policies to promote high-tech sectors (like the biotechnology sector) that address all the functions of the innovation system, create an environment conducive to entrepreneurial activity and are able to achieve better performance than countries with patchy and fragmented policies. An important point made was that focus on both the knowledge base and commercialization aspects are required for success-policies to create and sustain the knowledge base are crucial for commercialization, as these policies create the proverbial funnel from which commercial opportunities are identified, assessed and implemented.

Ten Year Plan

The DST has established a ten year plan (2008-2018) which will drive South Africa's transformation towards a knowledge-based economy in which the production and dissemination of knowledge produces economic benefit and enriches all fields of human endeavour. In his presentation Prof Pouris pointed out that the initiation of the IPR Act implies a radical shift towards a state-controlled commercialization process and ignores human nature. He described the IPR Act as overly prescriptive, bureaucratic and controlling.

Prof Pouris also noted that Universities do not have the power to implement regulations to all policies made. He concluded by making some recommendations with regards to the implementation of a beneficial relationship between the Department of Education and the DST to accomplish their mutual goals.

SMME-University collaboration in Finland

Mr Kari Paukkeri, CEO Licentia Ltd, Helsinki, Finland

In his presentation, Mr Kari Paukkeri discussed the Licentia model and the status of University/SMME interactions in Finland. Licentia is a company with technology transfer at the core of its business and is owned by the University of Helsinki and the state of Finland. It allows inventors a professional avenue to commercialize their ideas at market value. There are no upfront costs to inventors as patents, licensing and marketing costs are traded for a share of future revenues. Licentia Ltd has secured more than 100 license and option agreements in the areas of drugs and therapeutics, diagnostics and other life sciences.

Mr Paukkeri mentioned that in Licentia's experience less than 10% of innovations have the potential to develop into new enterprises. For a new enterprise to make sense there must be deep-pocketed, long-term investors, suitably skilled management, relevant partners and technology that is appealing to the industry.

In a self assessment of the Finnish model of Innovation, Mr Paukkeri mentioned that Universities are an integral part of the Government coordinated Innovation System. Coordination of Innovation is very much top-down with Competence Clusters, Centers of Expertise and Strategic Centers for Science Technology and Innovation being set up by Government to encourage collaboration and stimulate innovation between Universities and Industry. According to Mr Paukkeri, this model has proved successful for Finland, as is proven by the high rankings the country receives in the area of innovation.

Interaction between SMMEs and Universities in Belgium

Dr Nele Berthels, Technology Transfer Office, Katholieke, Universty Leuven

Dr Berthels opened her talk by stating that her career has been inspired by the desire to get biotech from the laboratories to the society where it is needed. She went on to mention that, as a world leader in pharmaceuticals, there are 30,000 employees in that industry in Belgium.

Success

Belgium is efficient in transforming innovation inputs into application outputs. This small country has been voted as the best country in the world for academic research and ranks among the top 10 countries worldwide for productivity and skills of its

labour force, scientific infrastructure, education system and quality of education at university level. This is all made possible by the government supporting R&D. Companies recruiting additional full-time R&D personnel qualify for a tax exemption of 12,780 € to 25,570 € depending on research level. There are also tax deductions or tax credits for investing in patents and R&D that promote environmentally friendly or energy reducing products and technologies.

Government Supported Projects

Only projects with specific time frames and designed in innovative collaboration are supported by Flemish government. These include projects such as the Technology Transfer Office, Strategic Basic Research, Agricultural Research and Applied Biomedical Research. Government focuses on an international dimension of knowledge development and the expansion of dissemination. Technology Transfer (TETRA) in Belgium focuses on developing a research base between universities and colleges to transfer technology between groups of companies and to bridge the gap between research and industry. Through collaboration between interested companies and sector federations, universities and colleges, beneficial feedback can be generated between the education system and industry.

TETRA

In collaboration with six schools in industrial engineering and biotechnology, TETRA focuses on academic tasks such as research, providing basic education, teaching common research strategies for science and engineering as well as technology. Another area of focus is academic research which involves bringing many research teams together to facilitate the interaction of these typically isolated groups. This encourages interdisciplinary interaction, providing a chain from basic curiosity-driven research to applied research. Such interaction resulted in achievements as shown in 2007 where 150 disclosures, 87 provisional patent filings, 26 PCT filings and 430 active patent families were produced.

Conclusion

Dr Berthels concluded by saying that Universities are fundamental in producing high quality research products and that an entrepreneurial climate should be created within the University to encourage researchers to work effectively. She also

recommended that a legal framework should be created regarding the exploitation of academic research and that clear incentive policies should be made to encourage research groups to actively seek knowledge transfer opportunities. There should also be clear regulation concerning ownership of intellectual property amongst Regional, Local and Shareholders. Government should support the building of partnerships by sharing new ideas and encouraging the practice of networking. She further emphasised that University professors should drive to be shareholders in companies.

Group Discussions

The attendees were divided into Biotech SMMEs, funding bodies and students. Each group was asked to consider University/SMME interactions from their unique perspectives and then provide feedback later.

Student Matters

Concerns

Dr Vorster, the student representative from the University of Pretoria, highlighted students' concerns towards their engagement into biotechnological business. He stated that students do not get enough opportunity to interact with industries, and that their curriculum does not involve any business- or law-related biotechnological entrepreneurship courses. Another concern raised was that exposure to careers in biotechnology business is very limited since the students do not realise that science can be integrated into business to produce a valuable product to society. Only when completing their honours are students introduced to biotechnology business aspects. During their junior studies they are never trained to learn and think in a critical way to create new ideas. This results in a restriction of their ability to invent useful business ideas.

Dr Vorster further noted that many student scientists cited the lack of information from industry to student as well as poor exposure to biotechnological business as a deterrent in continuing with scientific research at their higher levels of studies. As Universities serve as pools of information to produce commercialized products, the students recommended that junior students should be involved in such a way to view

the big goal. Such interaction between students and the University would further encourage students to deliver their results on time. The University should create an office where student ideas could be evaluated, as students did not seem to know which ideas are good and have the potential to be commercialized. Although the University of Pretoria has already created a TETRA office, none of the students know its function.

Dr Vorster added that Universities only focus on basic science and publication. Working with SMME would encourage Universities to focus more on productive research and would produce high quality results. He also illustrated that when you patent you cannot publish as patent projects always have long waiting period. This is discouraging to young scientists as success in science is judged by publication and most funding is only valid for three years.

Recommendations

The concerns raised by the students were addressed by various audience members from different sectors. Towards the end of the student's discussion, it was highly recommended that more interaction between students, industry and Universities is needed and that students should be exposed more to the interesting field of biotechnological business in their early junior studies. Dr Vorster further illustrated that, though internship provides some exposure to students, it does not cover a majority of students.

Internships are hardly ever advertised as most companies talk directly to the professors when they need interns. As a result only students who are the professor's preference get opportunities. In most cases only two in every ten students would have the opportunity to explore biotech business sectors. The involvement and connection of students with industries and Universities were highly recommended.

Universities and SMME groups

The discussion of the funding groups regarding their preference of either working with Universities or SMMEs, was tackled by a representative of Tshumisano Funding. He held that there are no incentives for Universities to conduct industrial research, although there are some incentives for inventors. He is also of opinion that

SMME-University collaboration is too narrow and should have a broader constituency. From an investor's point of view, funding for SMME would be the better choice since SMMEs typically request Universities to provide an innovation solution based on a market need. This also allows for existing innovations inside Universities to be linked to market applications, giving entrepreneurs in SMMEs the opportunity to take it forward. However, SMMEs need to see Universities as sources of information and Universities should be role models in putting research out. It is also important that academics have good finance management as there are numerous stories relating to money problems where funding never reached the research field.

He further remarked that funding SMMEs are perceived as being the better choice due to their breakthrough research and the fact that investors prefer to support those who can make quick products. He indicated that the tax policy is not well promulgated and that tax incentives should be better marketed to encourage funding bodies. Apparently, not many funding bodies know that, for eligible capital expenditure on R&D assets, a deduction for scientific or technological research is available at the rate of 150% of expenditure. He appeared very satisfied on the subject of the tax deductible percentage and emphasized the importance of marketing this valuable idea to R&D funding bodies.

The advantages of collaboration

The final discussion was led by an entrepreneur representative. He highlighted the fact that Universities needs SMMEs just as SMMEs need Universities. Collaboration between these two parties would help Universities gain exposure with regards to working against a deadline as well as learning the operations of business based research. He further stated that, without collaboration, Universities could take on much more than they can chew. As SMMEs are profit oriented partnerships with them will prevent this from happening. He went on to say that Universities, funding bodies and SMMEs needed to learn from other countries in order to improve skills by supporting our researchers at the point of technology transfer since the offices are only located in higher educational institutions. Lastly, he stressed that everyone from Universities and SMMEs as well as entrepreneurs should involve students more since they have a bigger impact on research products for commercialization.

Key Conclusions of the Group Discussions

Importance of Tech Transfer Officers (TTO)

- Skills: The importance of staffing the technology transfer offices with suitably skilled people was emphasized. It was recognized that this is a area where there are not enough professionals in South Africa,.
- Attitude of Technology Transfer personnel: Business is done on the basis of negotiations, so professionalism of technology transfer officers will improve the chances that companies engage with them
- Awareness - TTOs must ensure that students and researchers are aware of the services TETRA offers and they should encourage students to become more interested in their projects. TTOs should also encourage students to develop a business idea from their research project output.

Students

- Want more exposure to companies operating in biotech sector
- Want to be made aware of opportunities in the sector
- See interaction with TTOs as key to the process

Funders

- Are willing to fund good projects between Universittes/SMMEs
- Are looking for more interaction between the parties

SMMEs

- Would prefer to have IP ownership
- Want favourable licensing terms
- Would prefer to have more information on the full cost model for research as mentioned in the Act

Publicly Financed Research and Development Act

Following the discussions, Mr Sibanda gave an interesting talk on the Intellectual Property Rights from Publicly Financed Research and Development Act. He indicated that although almost 30 million rand from public funds is allocated to R&D, limited returns accrue from this investment. He said that South Africa is lacking in productivity and that our inventions only seem to benefit other countries as deals are often made that allow IP that could benefit the public to leave the country.

Generating IP

Mr Sibanda noted that when a student project or any project is funded by a public bursary, the IPR Act would be concerned with the IP generated from that particular research and the National Intellectual Property Management Office (NIPMO) would ensure that the IP is protected. When the project is fully funded by a private company, however, Government has power over the IP generated. Although Government is encouraging Universities to generate more IP, it is not happening yet. Meanwhile, small businesses are generating more IP since their focus is on the commercialising thereof.

Revenue generated by IP

IP creators at institutions and their heirs are entitled to at least 20% of the first one million rand of the revenue generated by the institution from such IP, or a higher amount as recommended by the Minister. Thereafter, at least 30% of the net income generated from such intellectual property is given to the institution. When Government compared Universities and SMMEs in terms of generating IP, it was revealed that Universities lacked the entrepreneurial skills as well as the relevant market insights to commercialise IP.

SMMEs, however, are well-equipped with entrepreneurial skills, making it a suitable environment for funders and scientists to invest their research in. Although some SMMEs generate IP, they are always looking for IP that can be commercialized. He observed that Government encourages collaboration between Universities and SMMEs for commercial preference as well as good IP management and certainty regarding IP ownership.

Ownership and Rewards

Dr Berthels stated that, in Belgium, when a University works with a company, the University also owns the research results and that the inventors should inform LRD before publication. Ownership of IP created as a result of collaboration between Universities and Industry is based on the major contribution between the collaborators. She further said that to get academic researchers on board, one should have clear rules on IP ownership as well as the inventor's reward and that entrepreneurial academics should be proactively sought out. She went on to say that

to get sustainable industry deals; one should explore alternative ways of reimbursement. Industry should be aware of their internship service to students or researchers and have background knowledge of the project and its output.

IP legislation

Finnish model

In his presentation on IP legislation regarding University/SMME interaction in Finland, Mr Pukkeri stated that money spent in Universities should benefit society. He indicated that the University Invention ACT 2007 aimed to identify and protect the exploitation of inventions for the convenience and benefit of the inventor, institution and society. This applies to Universities, Polytechnics and The National Defence Academy. Since Universities have no skills for commercialising science, it is obliged by law to put adequate administrative services into place. The New University Act 2010 will further extend the autonomy of Universities by giving them an independent legal personality as public corporations or foundations under private law. Management and decision-making systems will be transformed to facilitate operation in an international environment.

The purpose of this act is to enable Universities to react to changes in the operational environment, to expand their funding base to compete internationally for research funding and to be able to allocate resources to top-level. Their strategy focus-areas will strengthen their role within the system of innovation. In Finland, inventors from all categories are obliged to notify the University of all inventions including open/freeware research, contract research and all other research.

Conclusion

When evaluating policies from other countries regarding the protection of their IP, it is quite clear that their policies and acts are well structured. In Finland and Belgium, funding towards R&D in generating of IP and patent is highly encouraged by creating a tax friendly environment for companies to innovate and implement IP. This is an important point to consider. The IPR Act is well intentioned and will do much to put in place incentives for INVENTION. However, to extract the maximum value from this

invention, entrepreneurs and companies are required to disseminate or implement these inventions. The Technological Innovation Agency Act is meant to create more companies that commercialize these inventions. The Belgian and Finnish models have taught us that favourable tax incentives, the provision of high-tech infrastructure, and the creation of business-friendly innovation structures are required in addition to good policy framework.

University professors and scientists are allowed to be shareholders in companies as this promotes good cooperation based on pool flow of knowledge and decisions made between the University and SMME. It is apparent from the presentations from Belgium and Finland that collaboration between Universities and small businesses generate good IP and encourages research production that is beneficial to both joint IP and society. It is important to consider in this discussion that South Africa has a limited, ageing pool of scientific researchers at present. This limited pool of scientists is now being encouraged to undertake innovative research, at the expense of fundamental science. Coupled to this, one can question how many research scientists want to undertake innovative research-many of them only do so to sustain their research programs.

Appendix 1: Final Attendance List for IPR workshop



No	NAME	ORGANISATION
1.	Dr. Annelize van der Merwe	DNAbiotec (Pty) Ltd
2.	Mr. Dakshina Reddy	Senior Manager, Clinical Regulatory Affairs African Clinical Research Organisation (ACRO)
3.	Jeanette Morwane	Manager: Activator The Innovation Hub Management Company (Pty) Ltd Office M56, First Floor, The Innovation Centre
4.	Mrs Scheán Babst	DNAbiotec (Pty) Ltd
5.	Mr Ruan Versluis	DNAbiotec (Pty) Ltd
6.	Mr. Duncan Tungande	Tshumisano
7.	Ms. Mary-Ann Chetty	Project Manager: Bioprocessing <i>LIFE/lab</i>
8.	Dr. BJ Vorster	Forestry and Agricultural Biotechnology Institute (FABI)
9.	Kersch Naidoo	Council for Scientific & Industrial Research Project Manager/Engineer
10.	Suvina Sooknandan	<i>LIFE/lab</i>
11.	Dr Dale Gyure	<i>LIFE/lab</i>
12.	Dr Antonel Olckers	DNAbiotec (Pty) Ltd
13.	Harshik Gopal	Venture Capital SBU Industrial Development Corporation
14.	Peter van der Zee	Venture Capital SBU Industrial Development Corporation
15.	Dr. Wynand van der Walt	FoodnCropBio
16.	Sabine Hellyer	AEC-Amersham (PTY) LTD

17.	Divesh Munoo	University Of Pretoria
18.	Levanya Reddy	University Of Pretoria
19.	Joe S. Modise	Venda University of Technology (VUT)
20.	Zolani Dyosi	National Research Foundation
21.	Xiao Xing YU	University of Pretoria
22.	Themba Mathaba	Cape Biotech
23.	Lufuno Mashamba	Sylvean Biotech
24.	Nirvashnee Seetal	DST COFISA
25.	Chyreene Truluck	Innovation Fund
26.	Charleen Rupnarain	Innovation Fund
27.	Nele Berthels, PhD	K.U.Leuven Research & Development
28.	Kari Paukkeri	CEO Licentia Ltd.
29.	Verhoef, Gerard	
30.	Mclean Sibanda	Innovation Fund
31.	Prof Anastassious Pouris	University Of Pretoria
32.	Grant Napier	Elevation biotech
33.	Adv Donrich Jordaan <i>BLC LLB MPPS</i>	CEO: Sylvean Biotech (Pty) Ltd
34.	Mr. Viresh P. Ramburan	BioSA
35.	Mrs. Remi Akanbi	Projects & Information Manager AfricaBio
36.	Dr. Dave Keetch	AfricaBio